Minnesota Wildlife Habitat Evaluation System - Cropland Habitat

1. HABITAT INVENTORY

	Field(s)#	____	____	____	____	____	**Example**
a.	Residue Management						
	• No fall tillage (undisturbed)	20	20	20	20	20	**20<**
	• Overwinter residue 30-50%	7	7	7	7	7	7
	• Overwinter residue <30% w/food plots	4	4	4	4	4	4
	• Fall moldboard plow or <30% residue	1	1	1	1	1	1
b.	Crop Rotation						
	• Small grain/row crop/legume or strip cropping	10	10	10	10	10	10
	• Small grain/row crop	4	4	4	4	4	**4<**
	• Cont. small grain or row crop	2	2	2	2	2	2
c.	Field Border (minimum 10' width)						
	• Border around >50% of field	10	10	10	10	10	**10<**
	• Border around 25-50% of field	8	8	8	8	8	8
	• Border around <25% of field	3	3	3	3	3	3
d.	Distance to Concealment Cover or Woodland > 0.25 ac (measured from center of field)						
	• < 660'	10	10	10	10	10	10
	• 660'-1320'	6	6	6	6	6	**6<**
	• 1320'-2640'	3	3	3	3	3	3
	• >2640'	1	1	1	1	1	1
	TOTAL POINTS (max 50 pts)	____	____	____	____	____	**40**

---

2. CROPLAND HABITAT VALUE

Field cropland HSI = $\frac{\text{average of total points}}{50}$

BONUS POINTS: add 0.1 to the cropland HSI if any of the following features are present:
- field windbreaks
- hedgerows
- field borders/headlands
- cover crop
- food plots

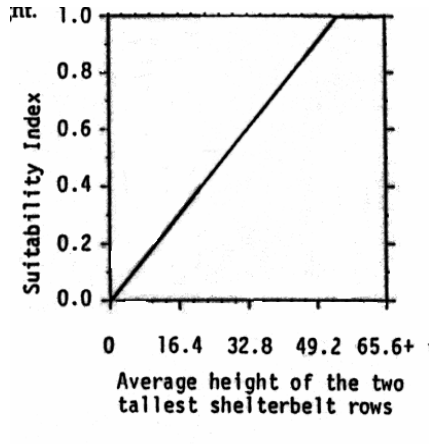
Existing Condition	_____	Alt #1 _____	Alt #2 _____	**Example**	**40/50=.80**
Habitat Acres	_____	_____	_____		**80**

Minnesota Wildlife Habitat Evaluation System
Shelterbelt Habitat

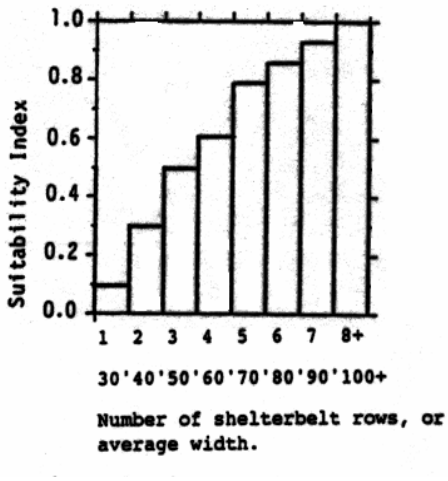
Shelterbelt No.	_____	_____	_____	_____	**Example**

1. HABITAT INVENTORY

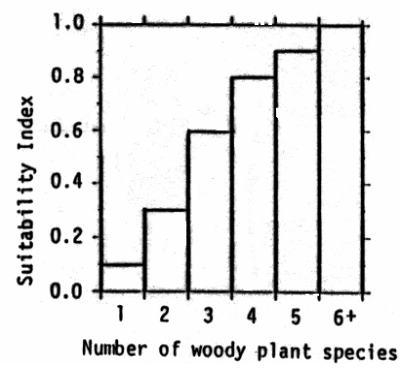
A. Average height of the two tallest shelterbelt rows, or projected height.	_____	_____	_____	_____	**0.5**



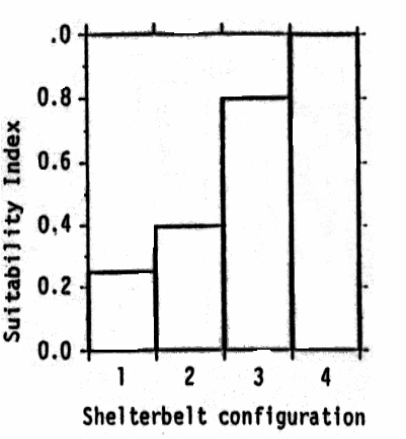
B. Number of shelterbelt rows, or average width.	_____	_____	_____	_____	**0.8**



C. Number of woody plant species.	_____	_____	_____	_____	**0.8**

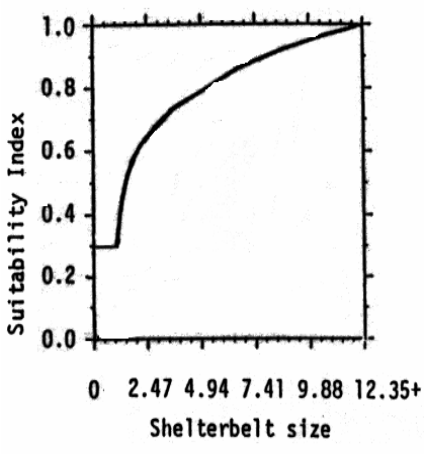


D. Shelterbelt configuration _____ _____ _____ _____ **0.8**



1) shrubs only
2) trees only
3) trees and shrubs, with an outside shrub row
4) trees and shrubs, with two or more outside shrub rows, with at least one conifer row on the inside

E. Shelterbelt size. _____ _____ _____ _____ **0.6**



(Minimum Value= 0.3)

F. Livestock Grazing

Shelterbelt grazed	0
Shelterbelt ungrazed	1.0

---

2. HABITAT VALUE:

Shelterbelt HSI = $[a \times \frac{(b+c+d)}{3} \times e] \times f$

BONUS: add 0.1 to the shelterbelt HSI if shelterbelt is within 1/4 mi of a winter food plot

Existing Condition _____ Alt #1 _____ Alt #2 _____ **Example** **5x (.8) x .3 x 1.0 = .24**

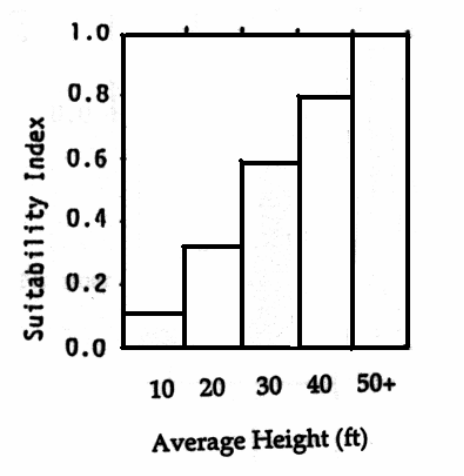
Habitat Acres _____ _____ _____ **3.0**

Minnesota Wildlife Habitat Evaluation System
Field Windbreak Habitat

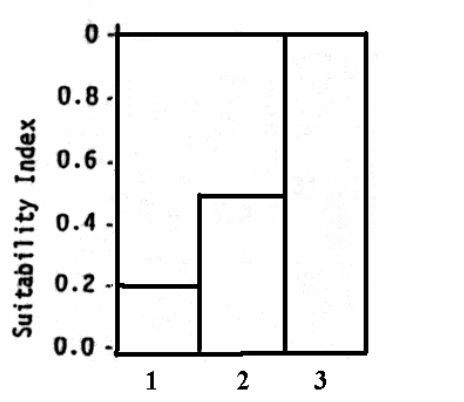
Windbreak No.	_____	_____	_____	_____	Example

1. HABITAT INVENTORY

A. Average height of the windbreak: _____ _____ _____ _____ 0.8

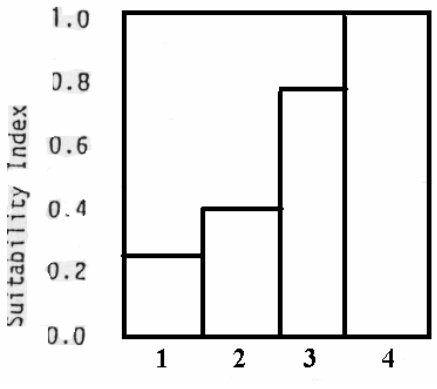


B. Windbreak Pruning: _____ _____ _____ _____ 1.0



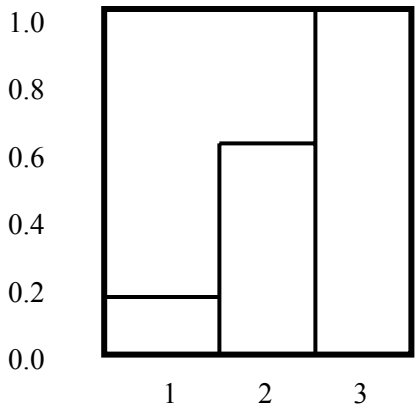
1) lower branches pruned
2) lower branches pruned, however substantial regrowth has occurred
3) windbreak not pruned

C. Adjacent cropfield use: _____ _____ _____ _____ 0.4



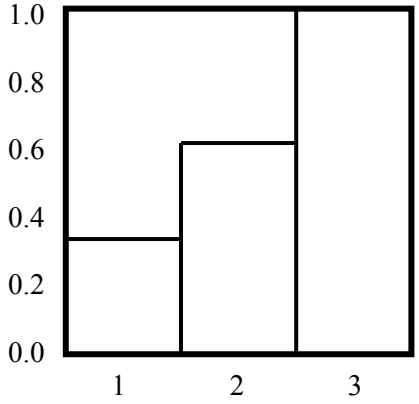
1) row crops
2) small grain
3) hayland
4) undisturbed herbaceous cover

D. Windbreak configuration: _____ _____ _____ _____ 0.8



1) shrubs only
2) trees only
3) alternating trees and shrubs, or multi row.

E. Number of rows: _____ _____ _____ _____ 0.6



Number of Rows

---

2. HABITAT VALUE:

Field Windbreak HSI = $\frac{(a+b+c+d)}{4}$ x e

BONUS: add 0.1 to the field windbreak HSI if the windbreak connects areas of undisturbed grass or trees.

Existing Condition _____ Alt #1 _____ Alt #2 _____ Example $\frac{3.0}{4}$ x 0.6 = .45

Habitat Acres _____ _____ _____ 3.0

Minnesota Wildlife Habitat Evaluation System
Grassland Habitat (includes permanent pasture, hayland, CRP/RIM, roadsides, conservation practices etc)

1. HABITAT INVENTORY

	Field(s) #	____	____	____	____	____	**Example**
a.	Vegetative Cover Height (April 15)						
	• >12"	10	10	10	10	10	10
	• 4"-12"	4	4	4	4	4	**4<**
	• <4"	1	1	1	1	1	1
b.	Herbaceous Vegetation Management.						
	• Undisturbed or prescribed management	20	20	20	20	20	20
	• Mowed between 8/1 & 8/15	10	10	10	10	10	**10<**
	• Rotational grazed pasture	6	6	6	6	6	6
	• Mowed after 8/15 or unmanaged pasture	3	3	3	3	3	3
	• Mowed before 7/15, or annually burned	1	1	1	1	1	1
c.	Vegetative Composition						
	• ≥ 3 native species (grass and forbs) native species, or	10	10	10	10	10	10
	• Domestic grass legume mixture	6	6	6	6	6	**6<**
	• Mixed domestic grasses	3	3	3	3	3	3
	• Monotypic domestic grasses or Reed Canary grass	1	1	1	1	1	1
d.	Size						
	• > 40 acres	10	10	10	10	10	10
	• 20 - 40 acres	6	6	6	6	6	6
	• 10 -20acres	3	3	3	3	3	**3<**
	• < 10 acres	1	1	1	1	1	1
e.	Configuration						
	• Minimum width, > 300'	10	10	10	10	10	10
	• Minimum width, 100 - 300'	6	6	6	6	6	**6<**
	• Minimum width < 100'	3	3	3	3	3	3
	TOTAL POINTS (max 60 pts)	____	____	____	____	____	**29**

---

2. GRASSLAND HABITAT VALUE

Field Grassland HSI = average of total points / 60

Bonus: Add 0.1 to the grassland HSI if grassland is adjacent to a watercourse (stream, ditch, lake, wetland).

Existing Condition	_____	Alt #1 _____	Alt #2	_____	Example **29/60=.48**
Habitat Acres	_____	_____		_____	**20.0**

Minnesota Wildlife Habitat Evaluation System - Deciduous Woodland

1. HABITAT INVENTORY

	Field(s)#	____	____	____	____	____	**Example**
a.	Grazing:						
	• Woodland ungrazed	20	20	20	20	20	**20<**
	• NRCS approved prescribed grazing plan	5	5	5	5	5	5
	• Woodland unmanaged grazing	0	0	0	0	0	0
b.	Tree Species Diversity						
	• >8 species; mixed size class	10	10	10	10	10	10
	• 4-8 species; mixed size class	6	6	6	6	6	**6<**
	• 2-4 species; and/or one size class	3	3	3	3	3	3
	• 1 species	1	1	1	1	1	1
	• Planned conversion to agricultural use	0	0	0	0	0	0
c.	Snags and cavity trees						
	• >8 per acre	10	10	10	10	10	10
	• 3-8 per acre	5	5	5	5	5	**5<**
	• <3 per acre	1	1	1	1	1	1
d.	Understory						
	• Mostly brushpiles, shrubs, herb. plants	10	10	10	10	10	**10<**
	• Scattered brushpiles, shrubs, herb. plants	5	5	5	5	5	5
	• None to few shrubs, herbaceous plants	1	1	1	1	1	1
e.	Mast producing trees (see glossary)						
	• Predominantly mast producers	10	10	10	10	10	10
	• Scattered mast producers	5	5	5	5	5	**5<**
	• None to few mast producers	1	1	1	1	1	1
	TOTAL POINTS (max 60 pts)	____	____	____	____	____	**46**

---

2. WOODLAND HABITAT VALUE

Field woodland HSI = average of total points / 60

BONUS: add 0.1 to the woodland HSI for a wooded riparian zone >200' in width.
add 0.1 to the woodland HSI if woodland is managed under a Forest Stewardship Plan.
subtract 0.1 from the woodland HSI for understory dominated by prickly ash, common buckthorn, or State listed noxious weeds.

Existing Condition	_____	Alt #1	_____	Alt #2	_____	**Example** **46/60=0.77**
Habitat Acres	_____		_____		_____	**25.0**

Minnesota Wildlife Habitat Evaluation System - Conifer Dominated Woodland

1. HABITAT INVENTORY

	Field(s)#	____	____	____	____	____	**Example**
a.	Grazing:						
	• Woodland ungrazed	10	10	10	10	10	**10<**
	• NRCS approved prescribed grazing plan	1	1	1	1	1	1
	• Woodland unmanaged grazing	0	0	0	0	0	0
b.	Tree Species Composition/Structure:						
	• >4 conifer species; mixed size class	20	20	20	20	20	20
	• Aspen/Birch with conifer understory	15	15	15	15	15	**15<**
	• 2-4 conifer species	8	8	8	8	8	8
	• 1 specie, or single size class	2	2	2	2	2	2
	• Planned conversion to agricultural use	0	0	0	0	0	0
c.	Snags and cavity trees:						
	• >8 per acre	10	10	10	10	10	10
	• 3-8 per acre	5	5	5	5	5	**5<**
	• <3 per acre	1	1	1	1	1	1
d.	Understory						
	• Mostly brushpiles, fruiting shrubs	20	20	20	20	20	20
	• Scattered brushpiles, fruiting shrubs	5	5	5	5	5	**5<**
	• Plantation with few shrubs or herbaceous plants	1	1	1	1	1	1
e.	Contiguous stand size :						
	• > 500 ac.	10	10	10	10	10	10
	• 250-500 ac.	7	7	7	7	7	7
	• 100-250 ac.	3	3	3	3	3	3
	• < 100 ac.	1	1	1	1	1	**1<**
TOTAL POINTS (max 70 pts)		____	____	____	____	____	**36**

---

2. WOODLAND HABITAT VALUE

Field woodland HSI = $\frac{\text{average of total points}}{70}$

BONUS: Add 0.1 to the woodland HSI for a wooded riparian zone >200' in width.
Add 0.1 to the woodland HSI if woodland is managed under a Forest Stewardship Plan.

Existing Condition _____ Alt #1 _____ Alt #2 _____ **Example** **36/70=0.5**

Habitat Acres _____ _____ _____ **75.0**

Minnesota Wildlife Habitat Evaluation System - Herbaceous Wetland

		Site(s)#	____	____	____	____	____	**Example**
1.	**WETLAND DIVERSITY**							
a.	WETLAND CLASS RICHNESS (see appendix on back)							
	• Three or more classes		10	10	10	10	10	10
	• Two classes		6	6	6	6	6	**6<**
	• One class		3	3	3	3	3	3
b.	DOMINANT SUBCLASS (see appendix on back)		____	____	____	____	____	**10.0**
c.	SIZE							
	• 10+ acres		10	10	10	10	10	10
	• 5-10 acres		8	8	8	8	8	**8<**
	• 2-5 acres		6	6	6	6	6	6
	• <2 acres		3	3	3	3	3	3
d.	SURROUNDING HABITAT (w/in 200' of wetland edge) (see appendix on back)		____	____	____	____	____	**6.0**
e.	INTERSPERSION							
	• Hemi-marsh		10	10	10	10	10	**10<**
	• Primarily emergent veg. w/interspersed open water.		6	6	6	6	6	6
	• Primarily single species,or low species diversity		3	3	3	3	3	3
f.	JUXTAPOSITION							
	• Site type is locally/regionally scarce		10	10	10	10	10	10
	• Site is part of a wetland complex		6	6	6	6	6	**6<**
	• Site not part of a wetland complex		2	2	2	2	2	2
2.	**WETLAND MANAGEMENT**							
a.								
	• Managed to increase diversity of plants, water level, duration.		10	10	10	10	10	10
	• Protected from uncontrolled fire, overgrazing, buffer present		8	8	8	8	8	**8<**
	• Wetland frequently cropped		2	2	2	2	2	2
	• Planned conversion to non-wetland without mitigation		0	0	0	0	0	0
	TOTAL POINTS		____	____	____	____	____	**54**
b.	Multiply total points by 0.5 if hydrologically altered.							
	ADJUSTED TOTAL		____	____	____	____	____	**54**_

NOTE: If any rating above is 0, the criteria is not met.

3. HERBACEOUS WETLAND HABITAT

Wetland Site HSI = average of total points / 70

Existing Condition	_____	Alt #1	_____	Alt #2	_____	**Example 54/70=.77**
Habitat Acres	_____		_____		_____	**5.0**

APPENDIX

Item 1A		**Item 1B**	
CLASS	NWI MAP	SUBCLASS	Item B RANKING
Open Water	PABG,H Lacustrine	vegetated non-vegetated	4 2
Deep Marsh	PEMF,G	------	10
Shallow Marsh	PEMC,F	ungrazed/hayed or cropped grazed/hayed frequently cropped	10 4 2
Meadow	PEMA,B	ungrazed/hayed or cropped grazed/hayed frequently cropped	6 4 2
Shrub Swamp	PSS	ungrazed grazed	8 2

Item 1D Predominant habitat within 200' of wetland

	RANKING
IF - Surrounding habitat is more than 75% permanent grass or woody vegetation.	10
IF - Surrounding habitat is 25% - 75% permanent grass or woody vegetation.	6
All Other Possibilities	2

Minnesota Wildlife Habitat Evaluation System - Wooded Wetland

		Site(s)#	____	____	____	____	**Example**
1.	**WETLAND DIVERSITY**						
a.	WETLAND CLASS RICHNESS (see appendix on back)						
	• Four classes		10	10	10	10	10
	• Three classes		8	8	8	8	**8<**
	• Two classes		6	6	6	6	6
	• One class		4	4	4	4	4
b.	DOMINANT CLASS						
	(see appendix on back)		____	____	____	____	**8.0**
c.	SIZE						
	• Over 500 acres		10	10	10	10	10
	• 100-499 acres		8	8	8	8	8
	• 50-99 acres		6	6	6	6	6
	• 10-49 acres		4	4	4	4	**4<**
	• <10 acres		2	2	2	2	2
d.	SURROUNDING HABITAT (see appendix on back)		____	____	____	____	**2.0**
e.	JUXTAPOSITION						
	• Permanently connected by streams to other wetlands or open water.		8	8	8	8	8
	• Seasonally connected by streams to other wetlands or open water.		6	6	6	6	**6<**
	• All others		4	4	4	4	4
2.	**WETLAND MANAGEMENT**						
	• Managed to increase diversity of plants, water level, duration		10	10	10	10	10
	• Protected from uncontrolled fire, and grazing		8	8	8	8	**8<**
	• Wetland frequently grazed		3	3	3	3	3
	• Planned conversion to non-wetland without mitigation		0	0	0	0	0
		TOTAL POINTS	____	____	____	____	**36**
b.	Multiply total points by .5 if hydrologically altered.						
		ADJUSTED TOTAL	____	____	____	____	**36**

NOTE: If any rating above is 0, the criterion is not met.

3. WOODED WETLAND HABITAT VALUE

Wetland Site HSI = $\frac{\text{average of total points}}{56}$

Existing Condition _____ Alt #1 _____ Alt #2 _____ **Example 36/56=.64**

Habitat Acres _____ _____ _____ **10.0**

APPENDIX

Item 1A		**Item 1B**
CLASS	Typical NWI	Item B RANKING
Shrub Swamp	PSS	8
Wooded Swamp	PFO1	8
Bottomland Hardwood	PFO1	8
Bog	PSS,PFO1,PEMB	6

Item D Predominant habitat within 200' of wetland.

		RANKING
IF -	Surrounding habitat is more than 75% permanent grass or woody vegetation	10
IF -	Surrounding habitat is 25% - 75% permanent grass or woody vegetation	6
All Other Possibilities		2

Minnesota Wildlife Habitat Evaluation System
Farmland Region - Habitat Quantity and Diversity

1. HABITAT INVENTORY
(these values apply to the entire farm/tract being evaluated)

a. Cropland Quantity:

Percent of farm/tract in cropland:

• 40-80	10
• 10-40 or 80-90	4
• <10 or >90	2

b. Grassland Quantity (including herbaceous wetlands):

Percent of farm/tract in grassland

• 20-40	10
• 10-20 or 40-80	4
• <10 or >80	2

c. Woodland Quantity (including wooded wetlands):

Percent of farm/tract in woodland:

• <10	10
• 10-20	4
• >20	2

2. DIVERSITY OF HABITAT: (cropland, grassland, woodland, wetland, lakes/ponds)
(measured from the center of the farm/tract)

Distance	No. of different cover types		
	>4	2-3	1
<1320'	10	8	4
1320-2640'	8	6	2
2640-5280'	6	4	0
>5280'	4	2	0

Circle the appropriate rating in each distance catagory, and score the single highest value.

NOTE: If any rating above is 0, the criterion is not met.

---

2. HABITAT QUANTITY/DIVERSITY VALUE

Farm/Tract Quantity-Diversity HSI = $\frac{\text{total points}}{40}$

Existing Condition _____ Alt #1 _____ Alt #2 _____ **Example 20/40=.5**

Minnesota Wildlife Habitat Evaluation System
Habitat Quantity and Diversity
Northern & Southern Forest Regions

1. HABITAT INVENTORY
(these values apply to the entire farm/tract being evaluated)

a. Cropland Quantity:

Percent of farm/tract in cropland:

• 20-40	10
• 10-20 or 40-80	4
• <10 or >80	2

b. Grassland Quantity (including herbaceous wetlands):

Percent of farm/tract in grassland

• <10	10
• 10-30	4
• >30	2

c. Woodland Quantity (including wooded wetlands):

Percent of farm/tract in woodland:

• 50-80	10
• 20-50	4
• <20 or >80	2

2. DIVERSITY OF HABITAT: (cropland, grassland, woodland, wetland, lakes/ponds)
(measured from the center of the farm/tract)

Distance	No. of different cover types		
	>4	2-3	1
<1320'	10	8	4
1320-2640'	8	6	2
2640-5280'	6	4	0
>5280'	4	2	0

Circle the appropriate rating in each distance catagory, and score the single highest value.

NOTE: If any rating above is 0, the criterion is not met.

---

2. HABITAT QUANTITY/DIVERSITY VALUE

Farm/Tract Quantity-Diversity HSI = $\frac{\text{total points}}{40}$

Existing Condition _____ Alt #1 _____ Alt #2 _____ **Example 20/40=.5**

MINNESOTA WILDLIFE HABITAT EVALUATION SYSTEM
SUMMARY WORKHEET

Landuser _____ Planner_____

Location _____ Farm/Tract # _____ Date _____

HABITAT TYPE	HSI	ACRES	WEIGHTED HSI	PLAN. UNIT HSI 1/

EXISTING CONDITION

Cropland	_____ X	_____ =	_____		
Shelterbelt	_____ X	_____ =	_____		
Field Wndbrk.	_____ X	_____ =	_____		
Grassland	_____ X	_____ =	_____	$\left[\frac{A}{B}\right]+\left[\frac{C}{2}\right]$ x .5	
Woodland (D)	_____ X	_____ =	_____		
Woodland (C)	_____ X	_____ =	_____		
Wetland (H)	_____ X	_____ =	_____		
Wetland (W)	_____ X	_____ =	_____		
Diversity	_____ **(C)**				
SUM		_____ **(B)** =	_____ **(A)**		_____

ALTERNATIVE 1

Cropland	_____ X	_____ =	_____		
Shelterbelt	_____ X	_____ =	_____		
Field Wndbrk.	_____ X	_____ =	_____		
Grassland	_____ X	_____ =	_____	$\left[\frac{A}{B}\right]+\left[\frac{C}{2}\right]$ x .5	
Woodland (D)	_____ X	_____ =	_____		
Woodland (C)	_____ X	_____ =	_____		
Wetland (H)	_____ X	_____ =	_____		
Wetland (W)	_____ X	_____ =	_____		
Diversity		_____ **(C)**			
SUM		_____ **(B)** =	_____ **(A)**		_____

ALTERNATIVE 2

Cropland	_____ X	_____ =	_____		
Shelterbelt	_____ X	_____ =	_____		
Field Wndbrk.	_____ X	_____ =	_____		
Grassland	_____ X	_____ =	_____	$\left[\frac{A}{B}\right]+\left[\frac{C}{2}\right]$ x .5	
Woodland (D)	_____ X	_____ =	_____		
Woodland (C)	_____ X	_____ =	_____		
Wetland (H)	_____ X	_____ =	_____		
Wetland (W)	_____ X	_____ =	_____		
Diversity		_____ **(C)**			
SUM		_____ **(B)** =	_____ **(A)**		_____

QUALITY CRITERIA

1/ In order to meet the Field Office Technical Guide Quality Criteria for Animal (Wildlife), the Habitat Suitability Index (HSI) for the entire planning unit must be greater than or equal to 0.50, and **any habitat type comprising more than 25 percent of the planning unit acreage must have a HSI greater than or equal to 0.50 for than habitat type.** In general, a HSI below 0.25 indicates poor habitat, between 0.25 and 0.5 is fair habitat, 0.5 to 0.75 is good, and above 0.75 is excellent habitat.